

# Water Use in Kentucky

Water Resources Board

August 29, 2016

Department for Environmental Protection  
Energy and Environment Cabinet



*To Protect and Enhance Kentucky's Environment*

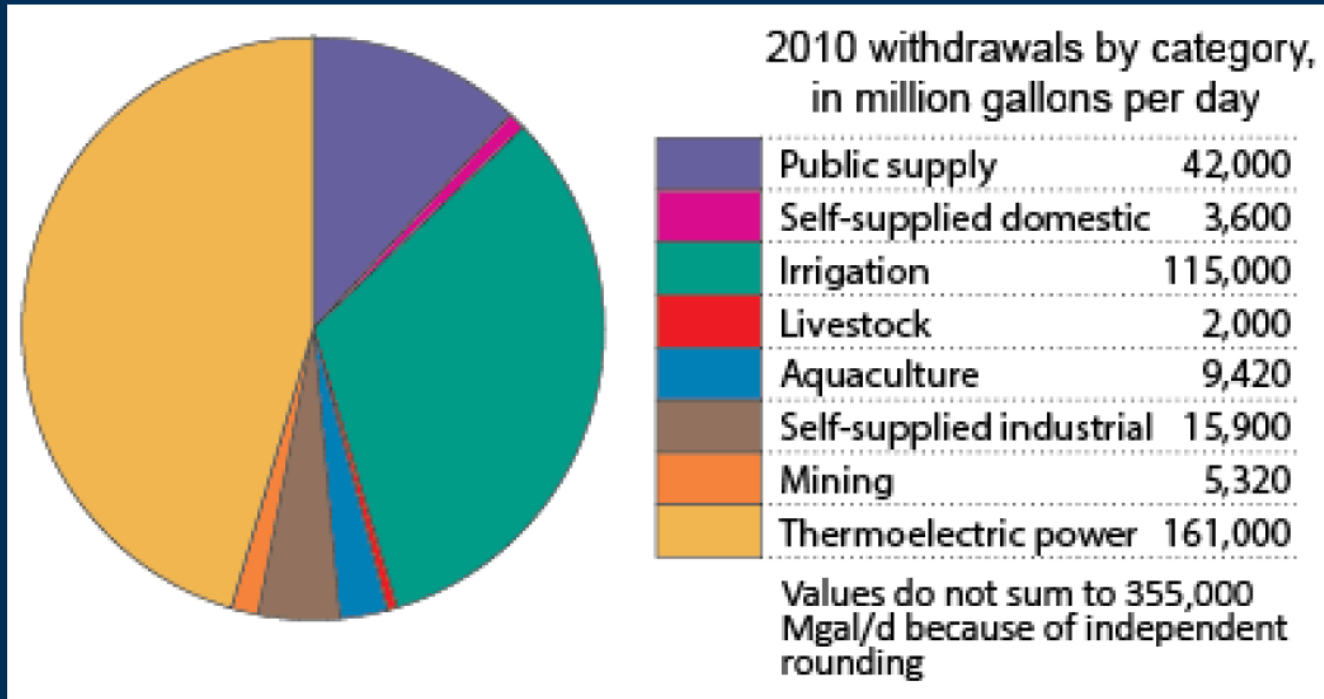
**Kentucky**  
UNBRIDLED SPIRIT™



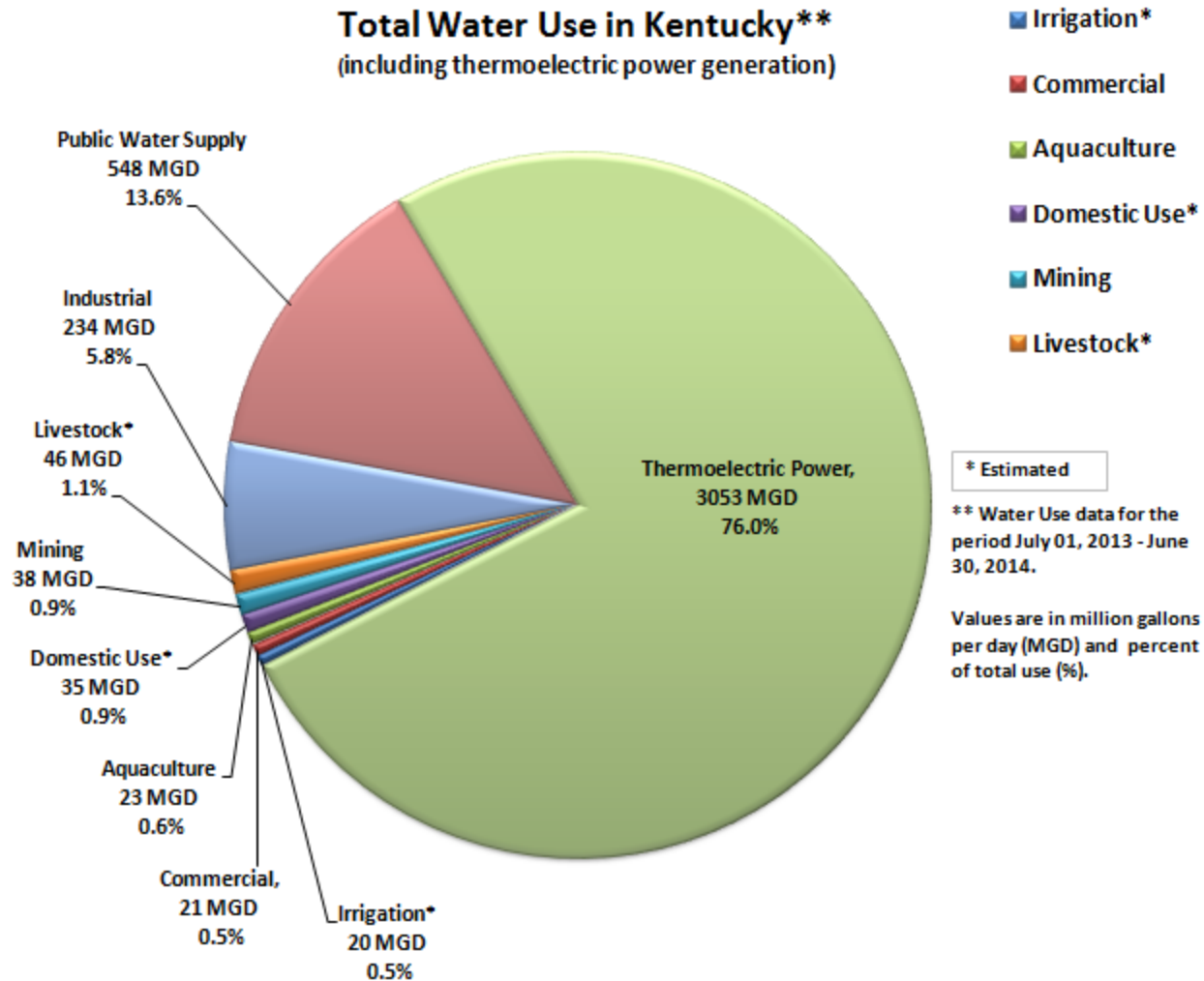
<https://www.kyfb.com/federation/water/resources/>



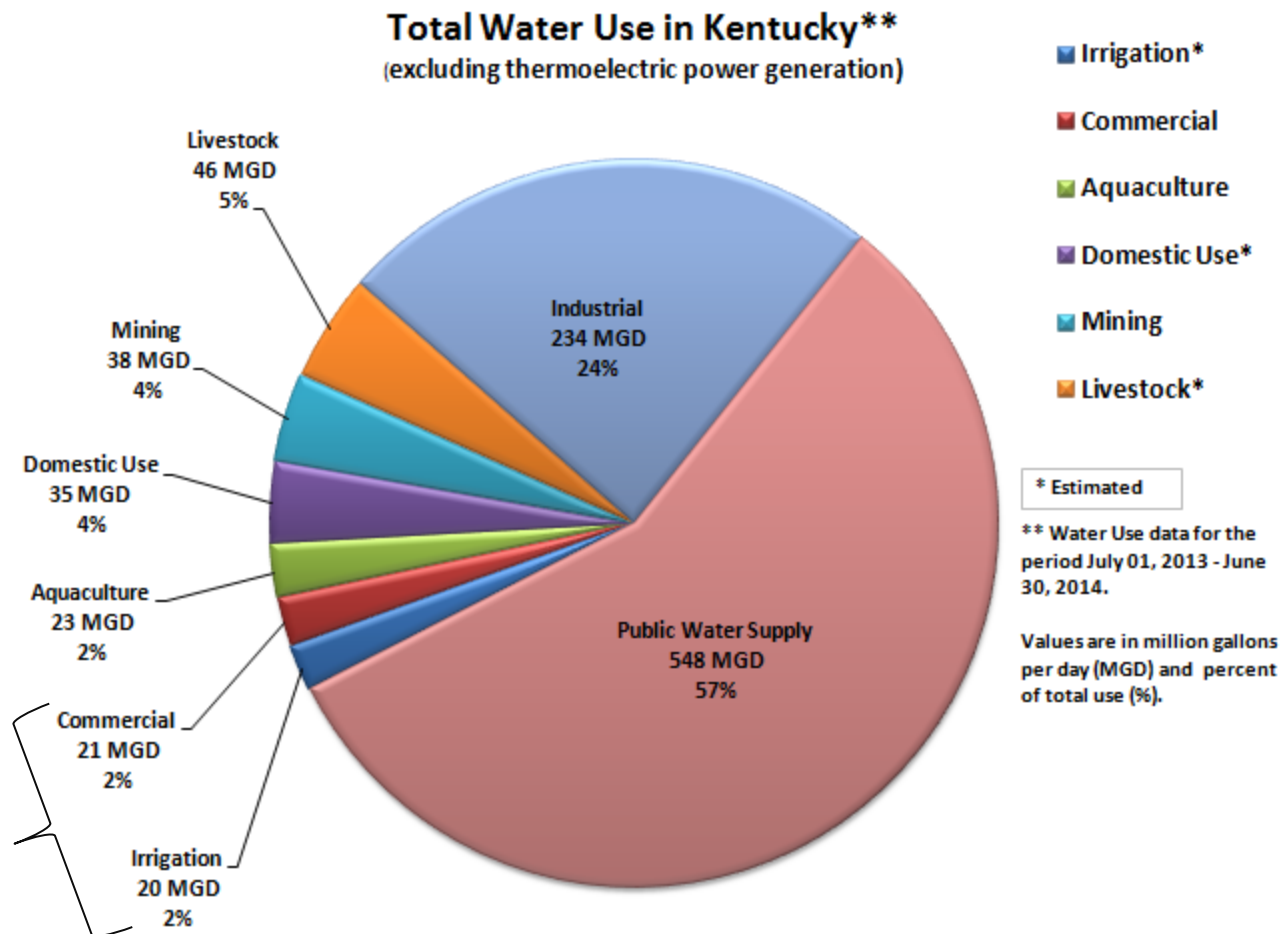
## National withdrawals by category



# Total Water Use in Kentucky\*\*



# Total Water Use in Kentucky\*\* (excluding thermoelectric power generation)

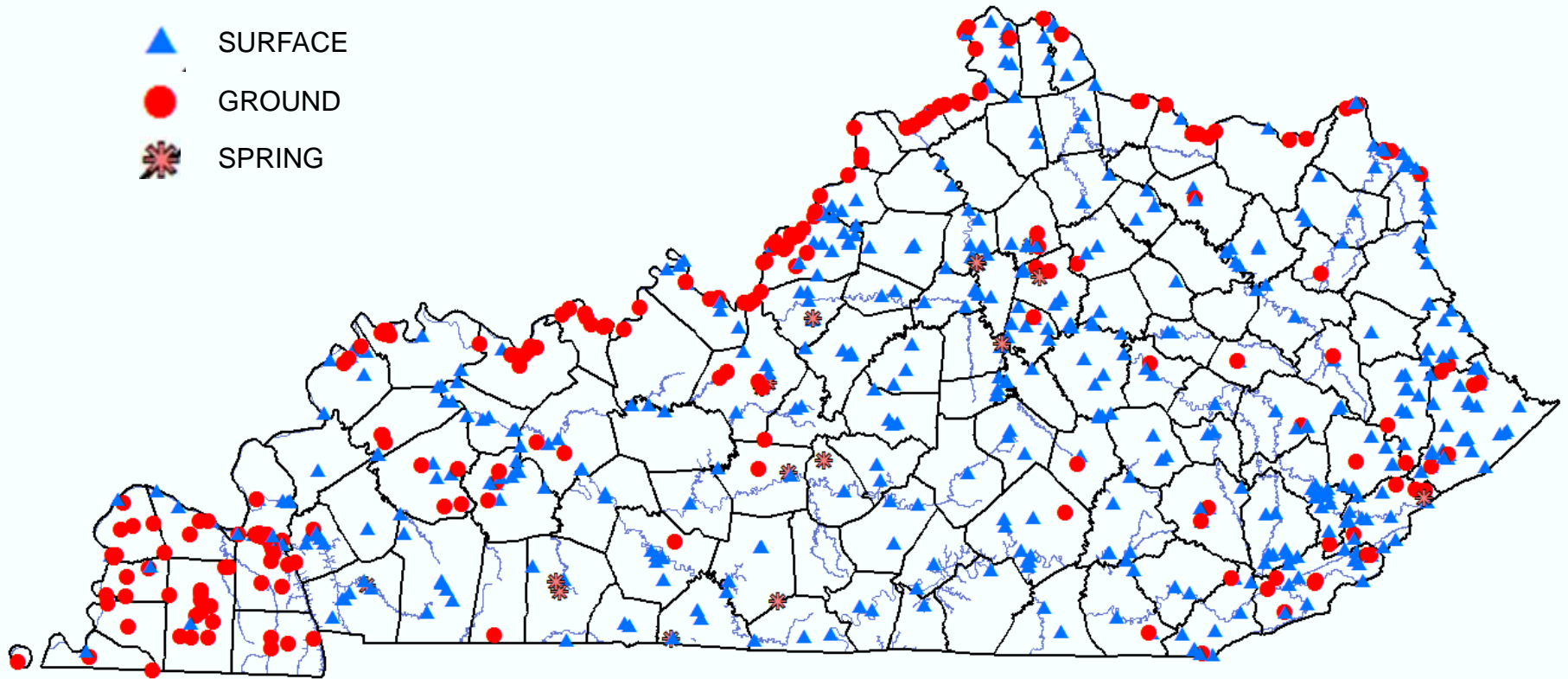


Irrigation "Seasonal" Water Withdrawal  
(90 – 120 days)

105 MGD to 145 MGD

# Regulated water withdrawals

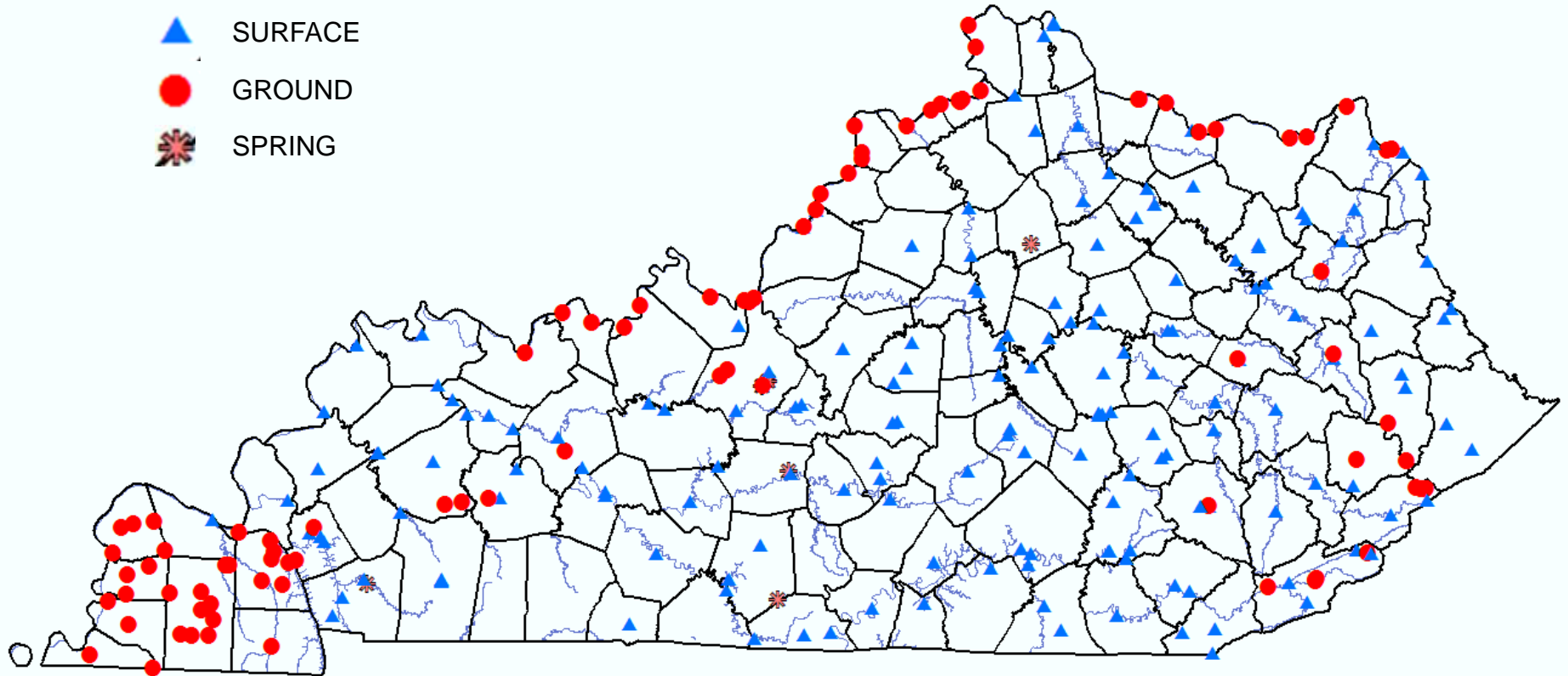
- ▲ SURFACE
- GROUND
- ✱ SPRING





# Regulated water supply withdrawals

- ▲ SURFACE
- GROUND
- ✱ SPRING



# Total Water Use in Kentucky, 2014

(excluding thermoelectric power generation)

Water Use Sector (Based on reporting from permitted water users)	Average Daily Withdrawal (MGD)				
	Rivers and Streams	Lakes and Ponds	Wells and Springs	USACE Reservoirs	Underground Mines
Public Water Supply	323.1	89.3	99.0	34.8	1.30
Industrial	146.2	4.5	79.5	3.6	0.00
Aquaculture	15.2	0.0	1.7	6.2	0.00
Mining	8.9	15.0	13.4	0.0	0.82
Commercial	5.2	2.5	10.3	0.3	0.04
<b>Total</b>	<b>499</b>	<b>112</b>	<b>204</b>	<b>45</b>	<b>2</b>



# Agriculture: Irrigation

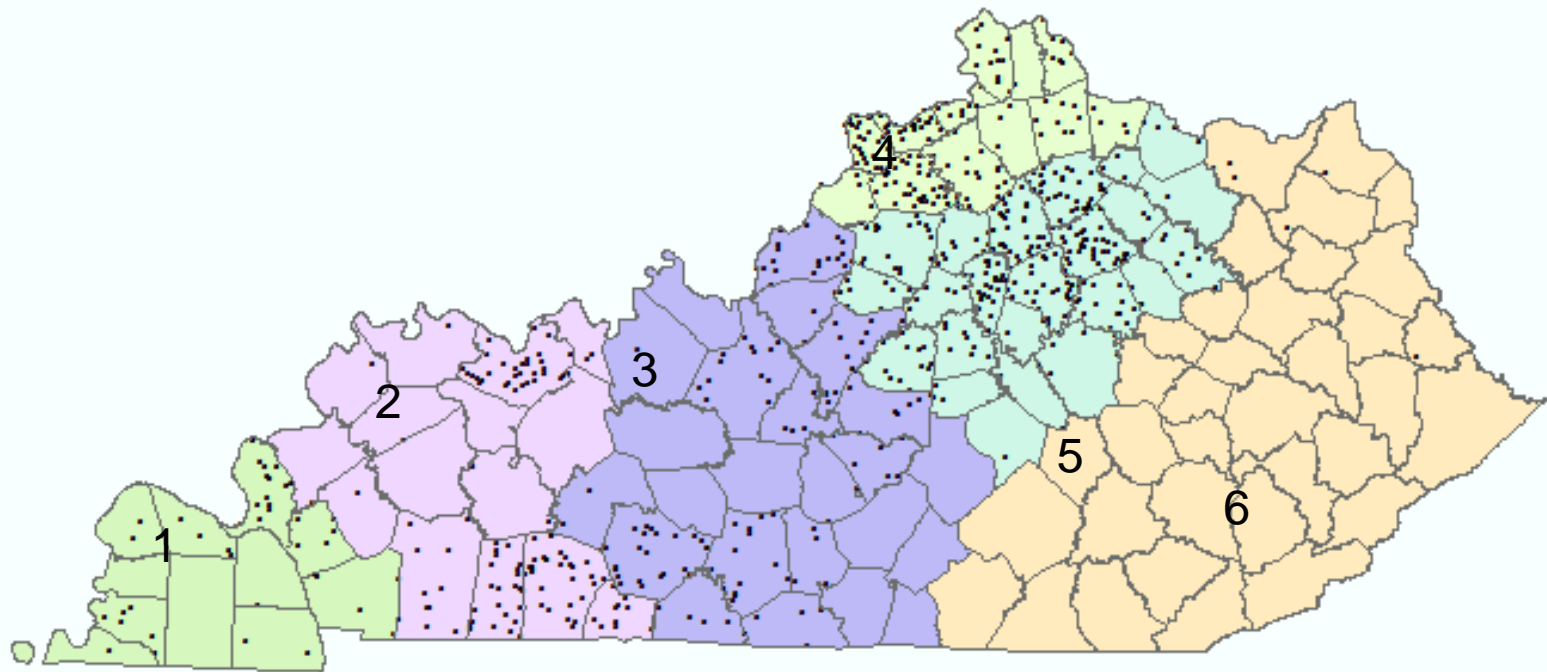
# 1964 Total Irrigated Acres

(across 6 agricultural districts)

**Total Irrigated Acres = 14,500**

Corn – 730 out of 981,000 (0.07%)

Tobacco – 10,230 out of 211,000 (4.8%)



One dot = 20 acres

Source: USDA Census of Agriculture



# 2007 Total Irrigated Acres

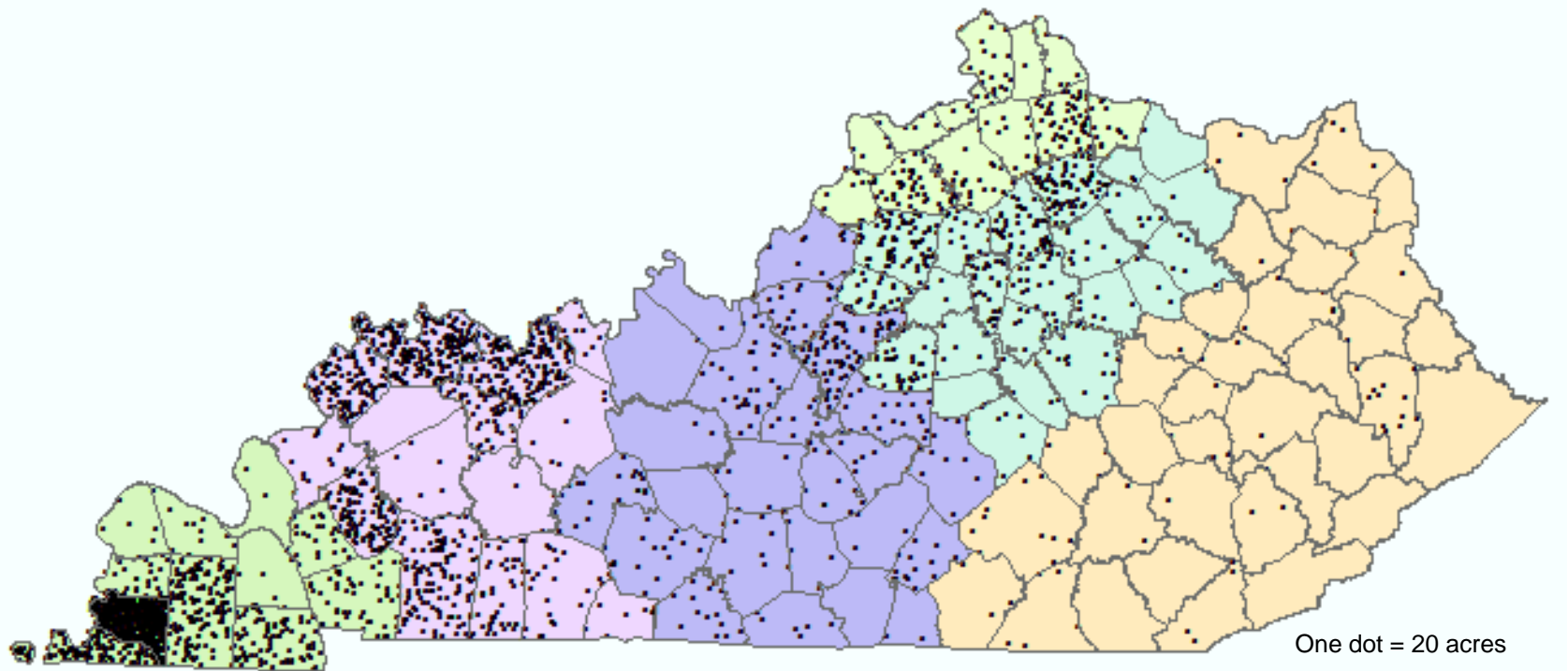
(across 6 agricultural districts)

**Total Irrigated Acres = 58,700**

Corn – 22,500 out of 1,310,000 (1.7% of Corn acreage)

Tobacco – 14,000 out of 87,000 (16.1% of Tobacco acreage)

Soybean – 10,000 out of 1,087,000 (0.92% of Soybean acreage)



Source: USDA Census of Agriculture

# 2012 Total Irrigated Acres

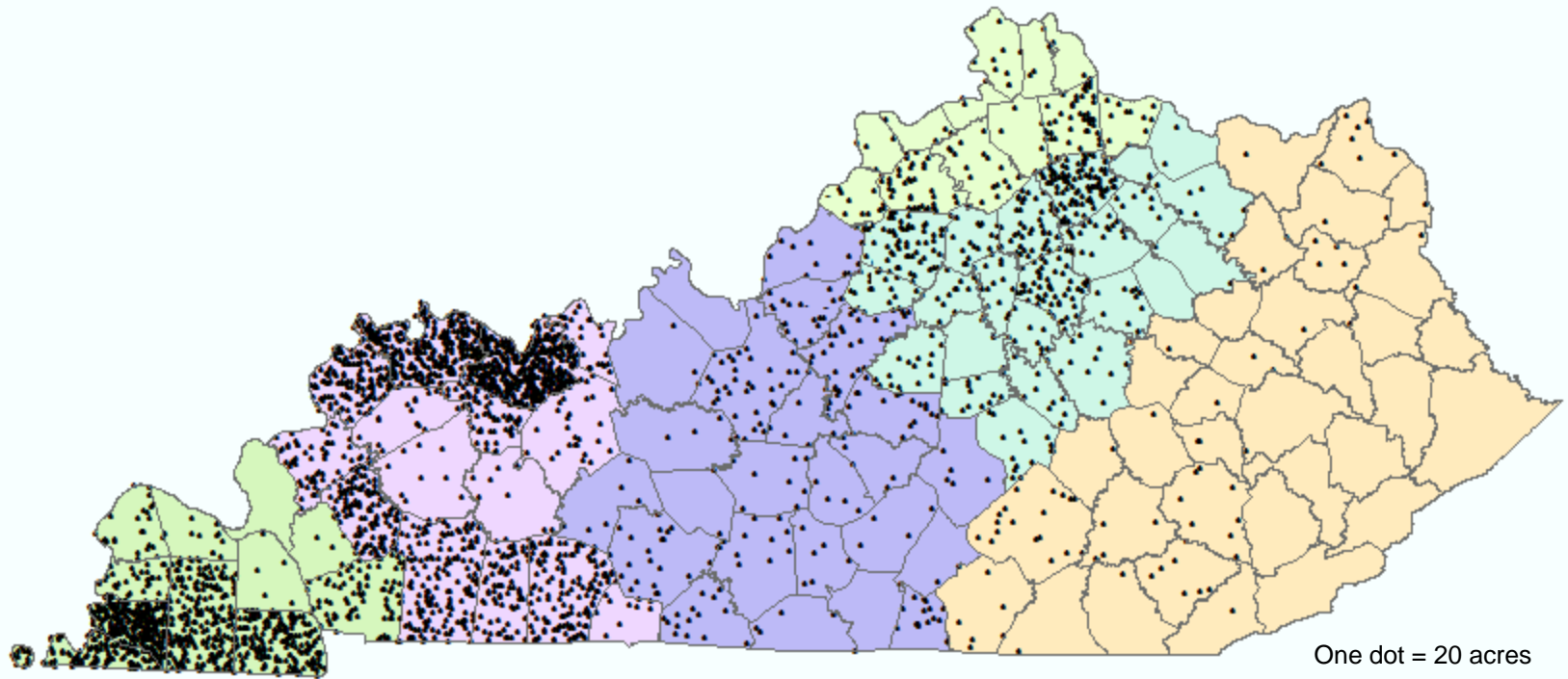
(across 6 agricultural districts)

**Total Irrigated Acres = 73,573 (25 percent increase over 2007)**

Corn – (2.1% of corn acreage) - increase of 41 percent over 2007

Tobacco – (14.5% of Tobacco acreage) – decrease of 9 percent from 2007

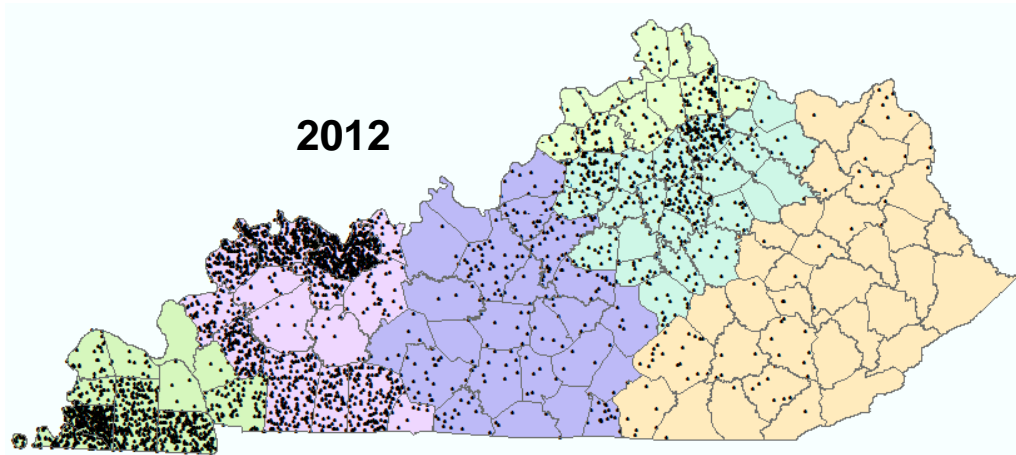
Soybean – (1.1% of Soybean acreage) – increase of 63 percent over 2007



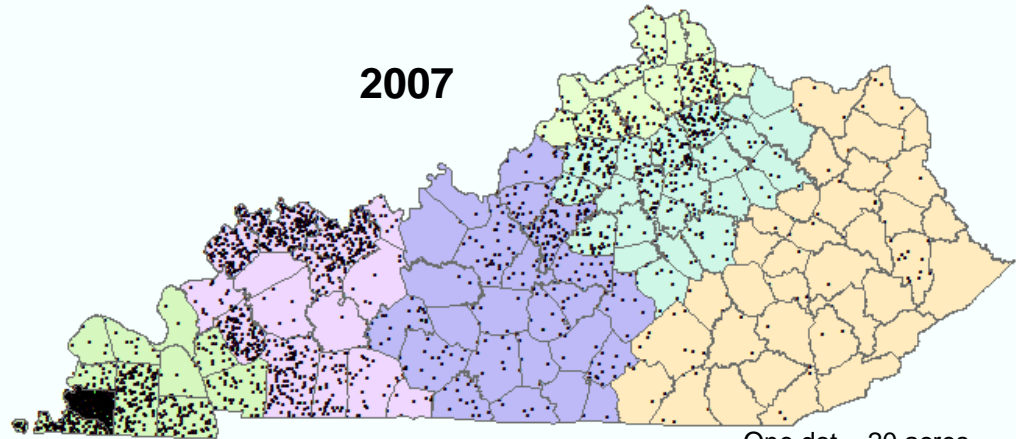
Source: USDA Census of Agriculture

# Total Irrigated Acres

(across 6 agricultural districts)



**2007**



One dot = 20 acres

Survey Year	<u>Acre-feet Applied</u>	
	Wells	Surface
1954	849	11297
1955	657	4988
1960	422	5654
1969	916	7247
1982	4012	17122
1998	9336	10395
2003	5253	4082
2008	9586	4958
2013	9043	10574

Source: USDA Census of Agriculture

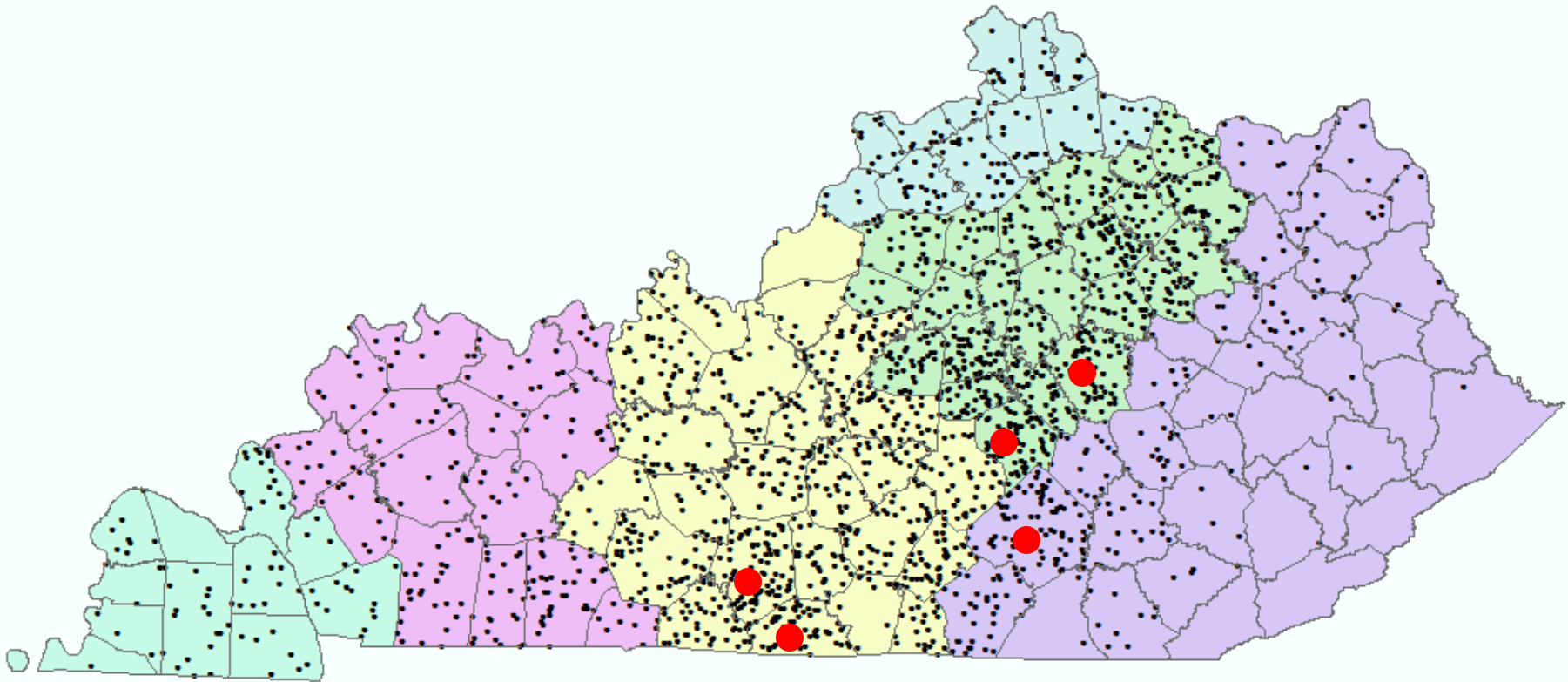


# Agriculture: Livestock: Cattle



# 2012 Cattle Populations per County

(across 6 agricultural districts)



One dot = 5000 Cattle

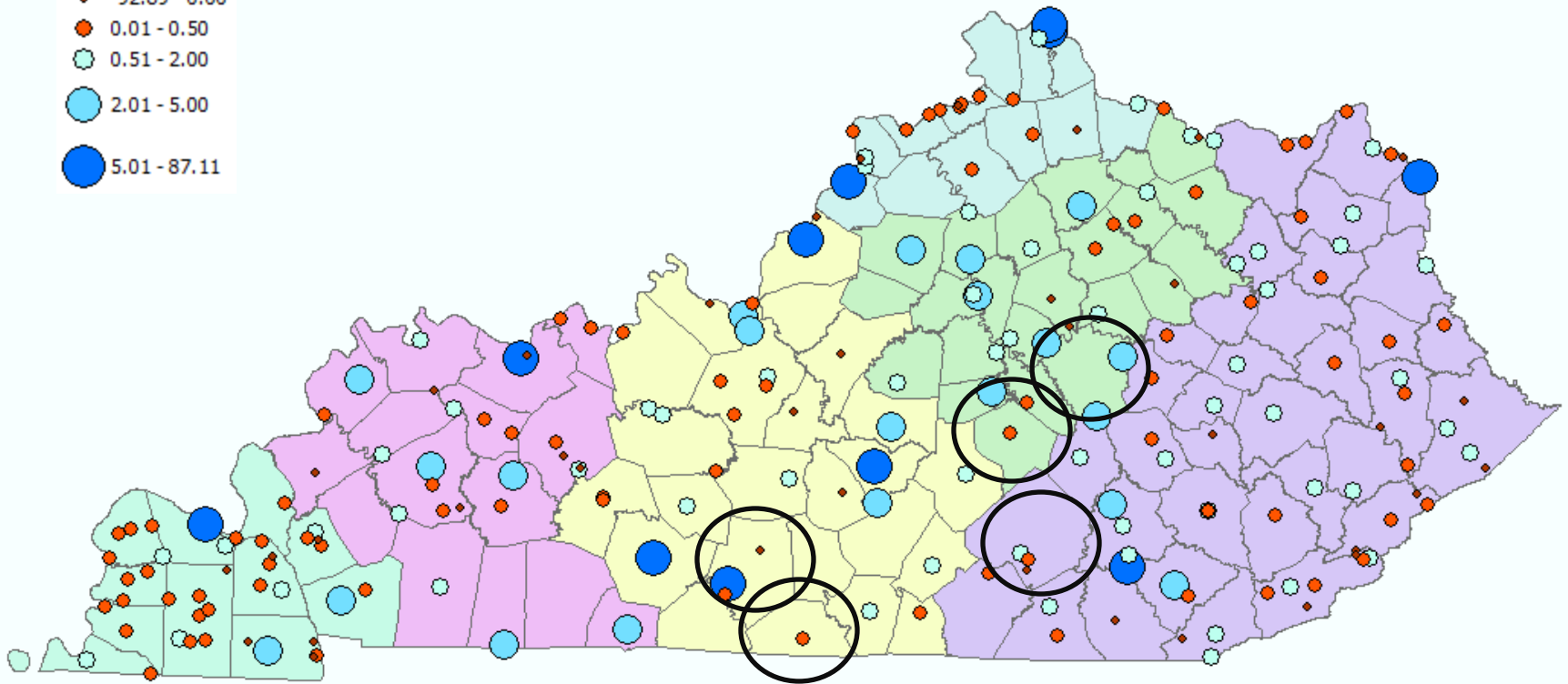
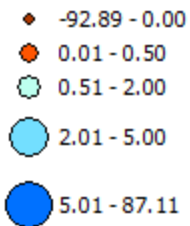
Source: USDA Census of Agriculture





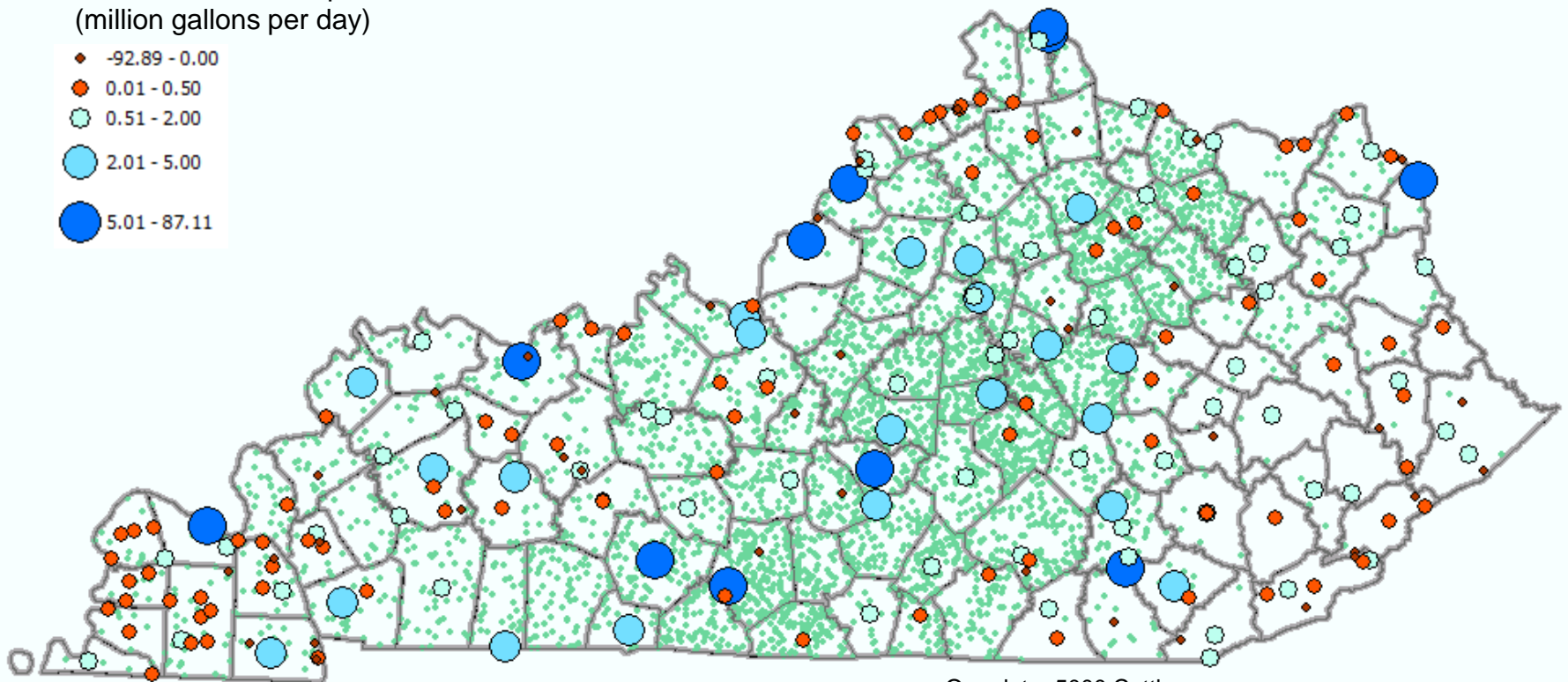
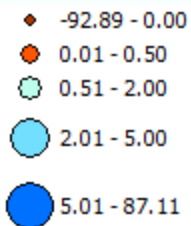
# Surplus of Kentucky Water Treatment Plants

Water Treatment Surplus  
(million gallons per day)

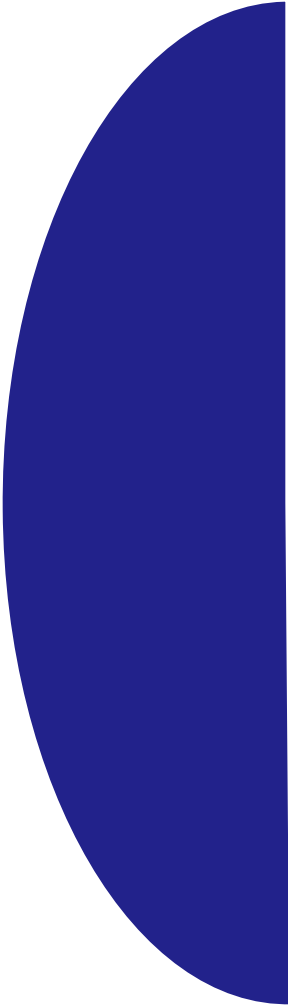



# Water Surplus and Livestock Demand (Cattle)

Water Treatment Surplus  
(million gallons per day)



One dot = 5000 Cattle



Difficult to project future increases in irrigation but a majority will likely occur in agricultural districts 1 and 2.

Potential for significant increase in agricultural uses of surface waters, not just wells.

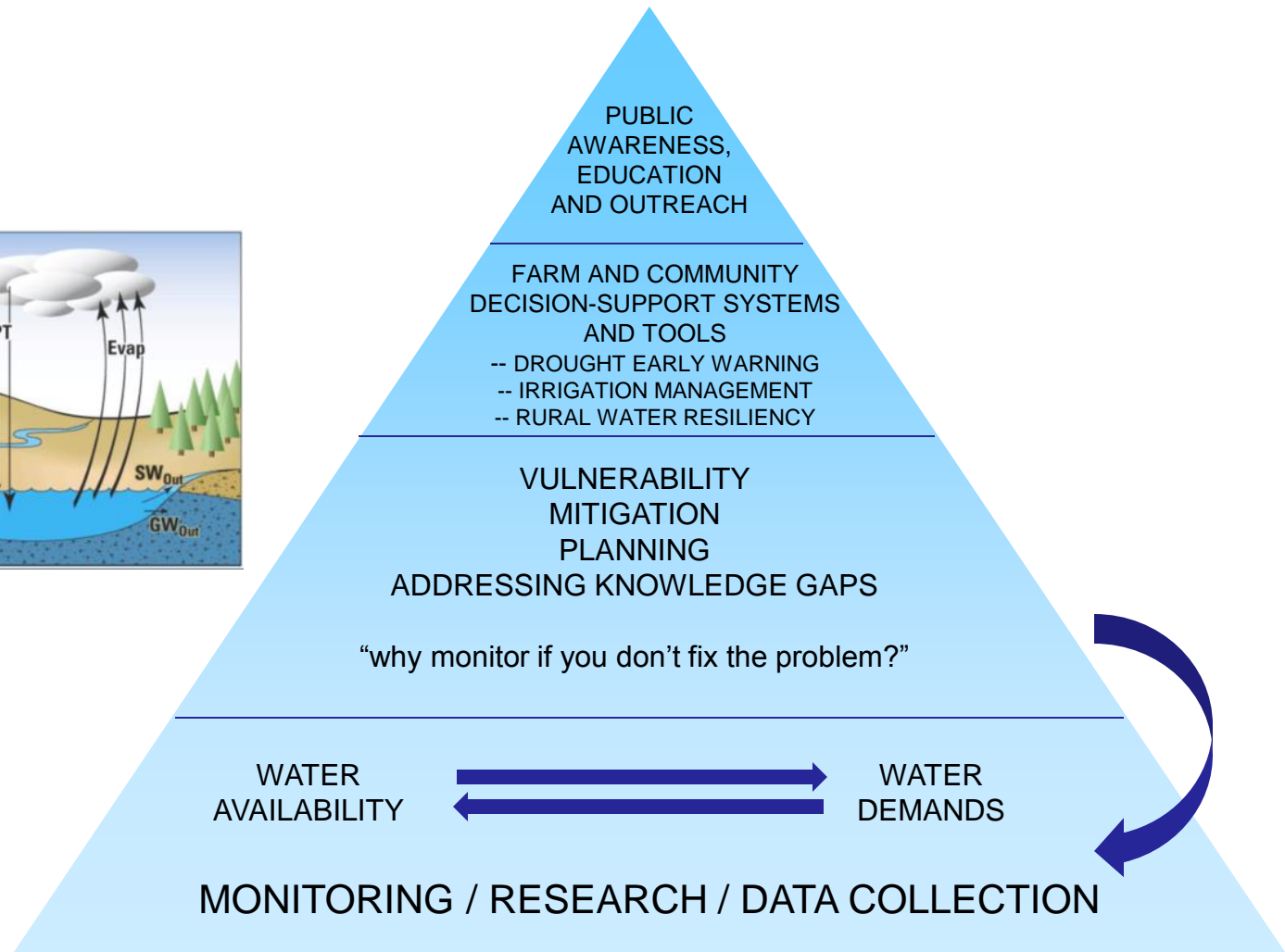
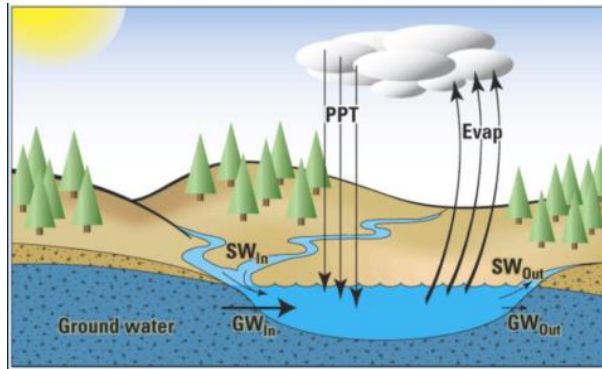
Important to project future-growth sectors' needs (rural population changes or new poultry and dairy operations for example)

Monitoring and data collection should include assessments of

- water availability and **demand** – surface water, aquifer, springs, lakes
- potential conflicts – users upstream and downstream, nearby domestic or public water supply wells, recreation.
- impacts to source water bodies – special use waters, impaired waters, regional availability

# Water Resources Development

## What do we need to know?



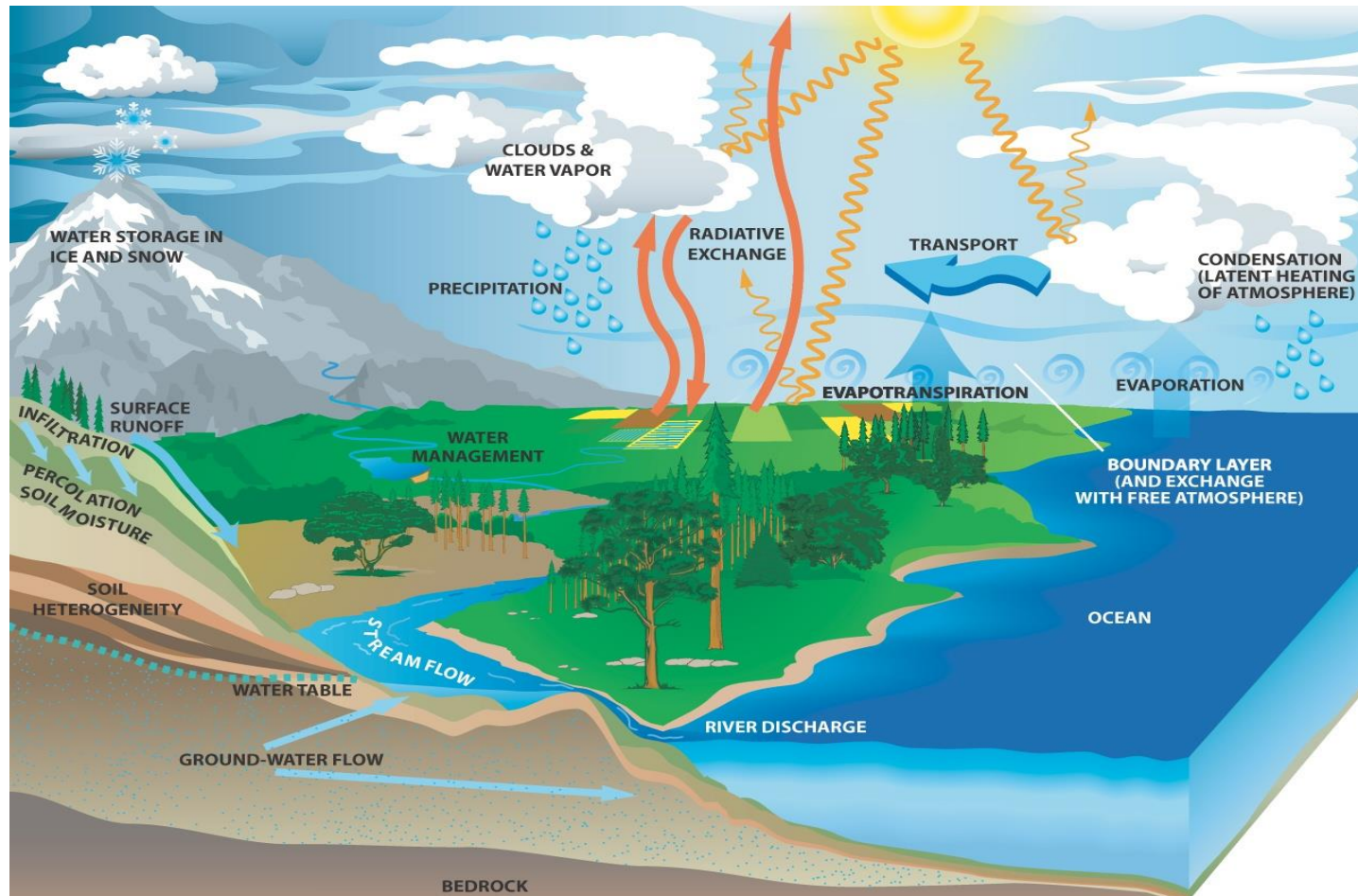
# State Drought Plan: Mitigation

- **Expand / Maintain data networks and provide long-term funding**
- **Inventory and quantify the state's available water resources**
- Identify and project drought vulnerabilities
- Pursue opportunities to increase available raw water supplies
- Improve state and local drought response
- Become more efficient in the use of the state's water resources
- Public education, awareness and outreach



# Water Resources Development

## The next few meetings



[Home](#)
[About](#)
[Live Data](#)
[Summary Data](#)
[Event Tracking](#)
[Outreach](#)

+

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## Warren County, KY

Bowling Green 4 E

Dewpoint: 71.2°F

Humidity: 100%

Precipitation: 0.00 in. (SINCE 12AM)

Wind: NE at 4 mph

71.3°

07:15 AM CDT

08/29/2018

[view local info](#) [set as home](#)

Temperature &gt;

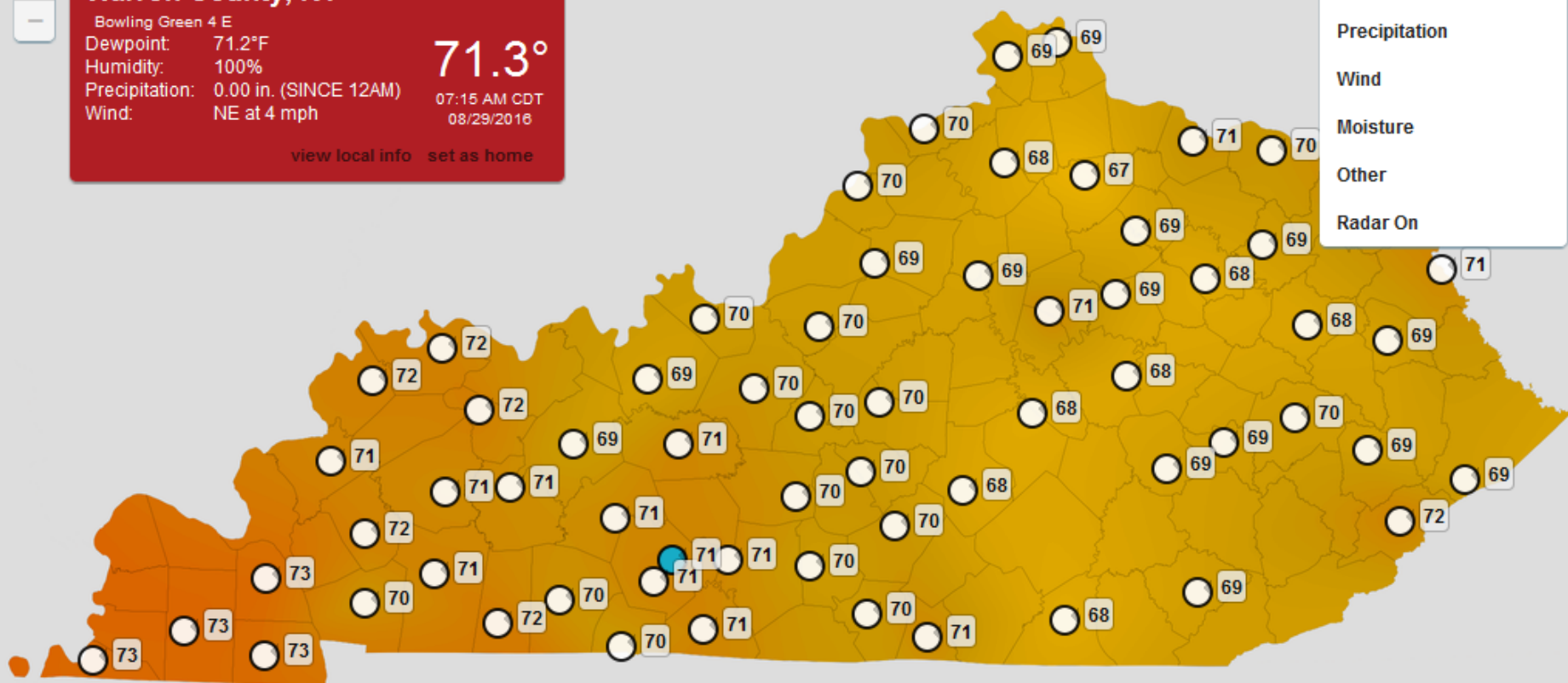
Precipitation

Wind

Moisture

Other

Radar On



Air Temperature Data Points on Air Temperature Contour Map

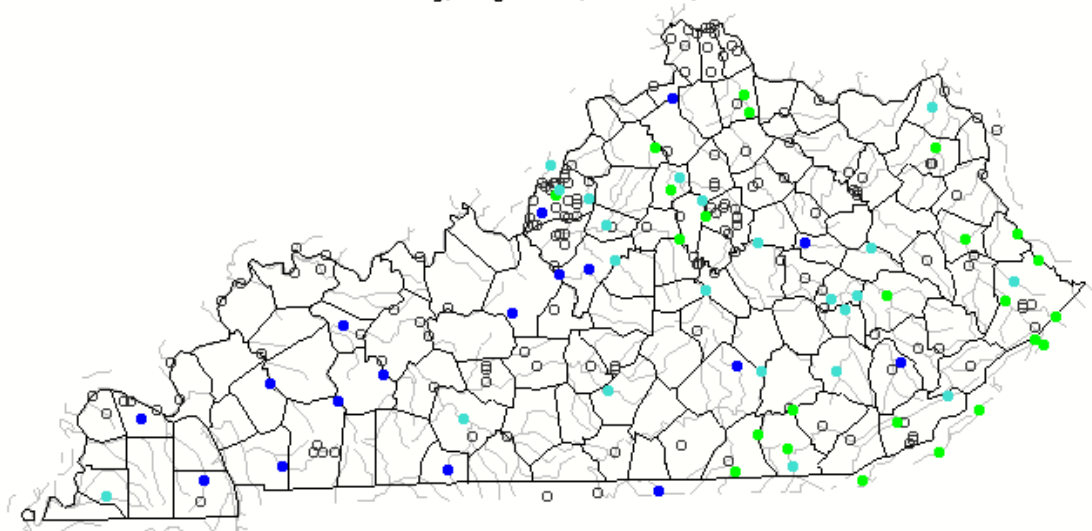




## Map of real-time streamflow compared to historical streamflow for the day of the year (Kentucky)

Kentucky ▼ or Water-Resources Regions ▼

Monday, August 29, 2016 07:30ET



Choose a data retrieval option and select a location on the map

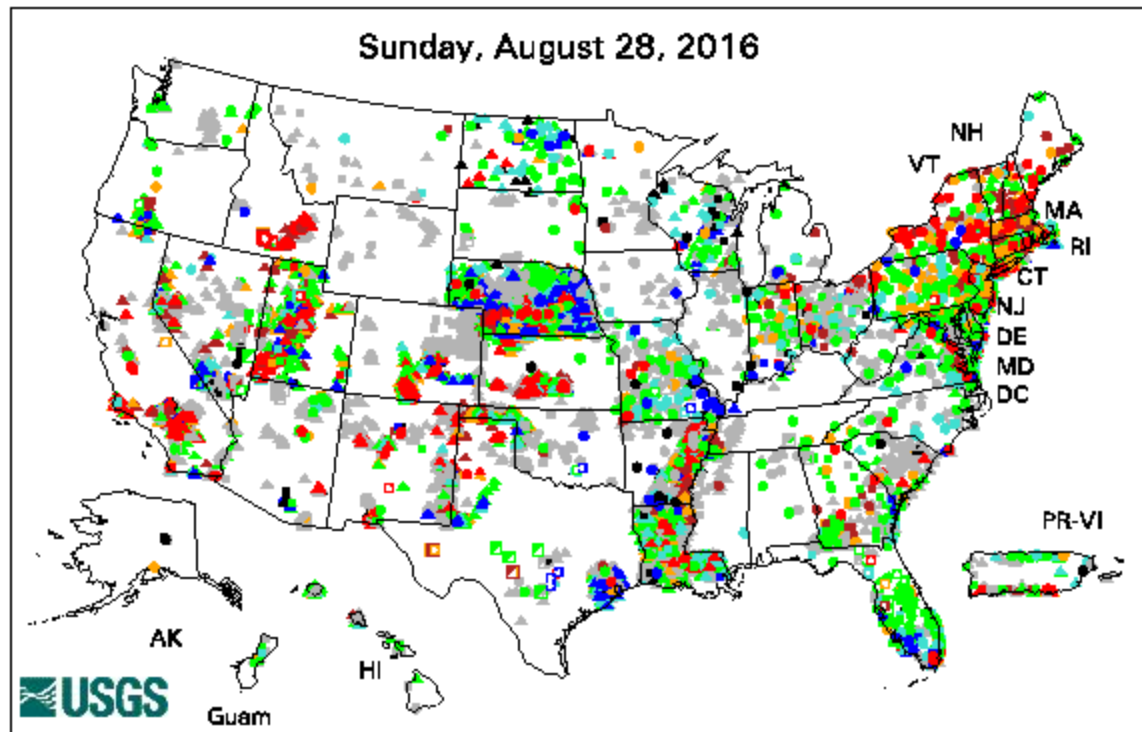
☐ List of all stations ☒ Single station ☐ Nearest stations ☐ Peak flow

Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		



## Active Groundwater Level Network

Sunday, August 28, 2016



Explanation - Percentile classes (symbol color based on most recent measurement)								Wells		Springs	
<span style="color: red;">●</span>	<span style="color: red;">●</span>	<span style="color: orange;">●</span>	<span style="color: green;">●</span>	<span style="color: cyan;">●</span>	<span style="color: blue;">●</span>	<span style="color: black;">●</span>	<span style="color: gray;">●</span>	○	Real-Time	■	
Low	<10	10-24	25-75	76-90	>90	High	Not Ranked	□	Continuous	■	
	Much Below Normal	Below Normal	Normal	Above Normal	Much Above Normal			△	Periodic Measurements	■	

### Active Well Count

Real-Time: 1,586

Daily: 1,189

Periodic: 16,049

Map generated 8/28/2016 11:36:17 AM